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Col. F. Lushnikov

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AN ACHIEVEMENT WHICH WILL NEVER BE FORGOTTEN BY MANKIND

From the Logbooks of the Cosmonauts V. Bykovskiy and V. Tereshkova

Krasnaya Zvezda
(Red Star), Moscow,
14 December 1963,
pages 3 and 4

Col F. Lushnikov

...The notebooks, in leatherette covers, were bulky and contained several dozen pages. On the cover there is the State Seal of the Soviet Union and, in large letters, the words: "Spaceship Logbook". Contained here are the notes made out in space (and while in a state of weightlessness) by cosmonauts V. Bykovskiy and V. Tereshkova.

At one time I have had the fortune of holding in my hand the unique clipboard of the world's first cosmonaut, Yuriy Gagarin. It was made of a thin sheet of plastic (white), bound in a metal frame. Attached to it was a pencil, which Gagarin used to make his entries. There were not many of these notes, for the flight itself lasted only one hour and 48 minutes. But these were the first entries made by man in space and were therefore of special scientific value.

The space ships of G. Titov, A. Nikolayev, and P. Popovich did contain regular logbooks, in which they put down in greater detail all that they saw.

Now, sitting before me were these new space documents. Hour after hour, day after day, V. Bykovskiy and V. Tereshkova put down a detailed, objective report on how they felt, and set down on the pages of the logbook their observations as well as their evaluations of the phenomena occurring in space. In significance, these entries are not only unique but are truly invaluable due to the depth of the analysis contained in them. The spacemen emerge from these notes not just as impassive observers, but as researchers presenting their points of view on the many phenomena.

These entries differ both as to volume and as to character. They cover the way the spacemen felt, the work of the spaceship's multitude of instruments, as well as the observations of the space around them which they made through their illuminators.

Among the entries are many extremely valuable suggestions regarding the spacemen's equipment and working conditions in the spaceship. Every line is imbued with the spirit of the greatest possible optimism, of unlimited faith in their equipment, and in the successful outcome of

their flight. It is an inspired hymn to the Party which raised such heroes, to Soviet scientists and designers, and to all the Soviet people, who were the first to pave the way into space.

A great deal of factual material was derived as the result of the flights made by V. Bykovskiy and V. Tereshkova, material which will aid us in the further development and improvement of spaceship guidance systems.

From the Logbook of V. Bykovskiy

It is with emotion that we turn to page one of the logbook kept by Lt. Col. V. Bykovskiy, who holds the record for space flight. No one before him was ever out in space as long as he was. One hundred and nineteen hours and six minutes, a little over 81 orbits around the Earth, and over 3,300,000 kilometers of space flight -- such is his unsurpassed record. The entries are precise and laconic, made in small but legible handwriting. It can be seen from them that V. Bykovskiy rapidly acclimitized himself to the situation and that he felt right at home.

Here is one of his first entries:

"The amount of excess weight on the portion of the capsule still in flight is not great. The cutting-in of the last stage was a most pleasant sensation. There was a sharp drop in excess weight and, I would say, an imperceptible cutting-in of the last stage. I even reported that I did not feel it when it had cut in. My state of mind is excellent... Pulse good (60). Respiration -- 8-10."

We turn to other pages. Here are entries of his observations of the Earth.

"Watched the vapor trail of an aircraft over France. The view is excellent. Ships in the Mediterranean Sea can easily be seen."

V. Bykovskiy accompanied that last entry with an illustrative sketch: two vessels following one another, and, behind them, the churned-up water of their wakes stretching and expanding.

"Had good views of Leningrad, the Suez Canal, the Nile, and all of Egypt. There was no smoke to be seen anywhere. Had an excellent view of a thunderstorm."

A new page, new observations:

"The visibility of rivers is very good. I can see their old, dried-up beds and where the water is running now. My visibility of the seas is better than that of the oceans. There is almost always a haze over the oceans. The shoreline can be seen precisely. Judging by it, I determined the correctness of the capsule's course."

"The icebergs in the Antarctic and in Greenland can easily be seen. General orientation can be done very easily."

As is well known, the cosmonauts conducted not only visual observations but took pictures also. Many of these were later to be published in the press or became important parts of films. There is an entry about this in the logbook.

During their space flights, G. Titov, A. Nikolayev, and P. Popovich observed tiny white particles following their capsules. V. Bykovskiy also turned his attention to this phenomenon. There is this entry in the logbook:

"...Whenever the capsule emerges from the shadows and there is an increase in the intensity of the light on the capsule to the left of me, then, in the right porthole, I can see moving points of light at distances ranging from 20-30 centimeters and up to 2 meters from the capsule. Their movement is such as if to give the illusion that they are falling behind the capsule or that the capsule is overtaking them. I observe this effect every time we emerge from the shadows. I see them (these particles) every time."

"I must ask Earth about it and even instruct 'Chayka' to observe them also."

There are quite a few entries about weightlessness in the logbook. Afterwards, on earth after his flight, Bykovskiy told of how being in a state of weightless ness was a unique delight. Here is what he wrote about it during his 18th orbit, at 1506 hours:

"I unfastened myself. It was not difficult to do; in fact, it was easier to do than on Earth. After a certain length of time, you can do whatever you wish, i.e., rapidly or slowly. But it is not necessary to speed. There are no unpleasant sensations. I did everything in accordance with plan. Did everything very easily. Various ways of movement about in the capsule are possible. There is a lot of space to move in. I floated around for one whole orbit. If there was a detached air supply available, one could remain in a state of weightlessness as long as he wanted to."

A characteristic reminder, this "There is a lot of space to move around in." In Brazil, in Sao-Paulo, in one of the pavilions devoted to the International Aviation and Space Exhibit, we had the opportunity to study the spaceship carefully, the capsule in which the American Walter Shirra made his flight around the Earth. A pilgrimage atmosphere was being created about the ship. Every visitor to the exhibit wanted not just to see it but to touch this space "house" with his hand.

But this capsule did not leave our flier cosmonauts A. Nikolayev and P. Popovich with any sense of rapture. It is so small that there can be no talk of floating around in it in a state of weightlessness. And Nikolayev was correct then when he commented:

"Yes, there isn't much room to stroll around in."

Yet in the capsule of our "Vostok" there really is "lots of room." This is what V. Bykovskiy jotted down during his 34th orbit, at 1606 hours:

"The disengagement of capsule and rocket took place within the zone of operation of television. I was in free flight. It was easy. There were no difficulties. What joy it is to look out the portholes. The angle of view is beginning to open up considerably. It is very difficult to determine spatial position. With the light out it is difficult to orient oneself. There is neither floor nor ceiling."

Here is what was entered at 1706 hours on the 50th orbit:

"I like to anticipate the time when it is necessary to unfasten myself. It is very pleasant. Unfastened from my seat, it is easy to reach any object and to take pictures. What bliss to fly motionless through the air!"

Yes, it is for us earth-bound people but to envy this blissful state of the cosmonaut, when he is in a state of weightlessness. However, the state of weightlessness has not been fully explored, especially when it comes to the issue of more prolonged cosmic flights. Here even Mother Nature is hiding her secrets from us. Through their flights of many days the Soviet spacemen placed in the hands of scientists a plenitude of material, material which will enable them to penetrate still further the curtain of mystery over the enigmatic influence of weightlessness upon the human organism.

The spacemen, as is known, did not simply sit and contemplate the black silence of outer space. In looking outside their capsules, they did not simply enjoy the wonderful picture afforded by the sunrise, by the cold shining of the stars and of the Moon. They worked. They did a lot of work, did it intensively. They kept in constant touch with Earth, informed one another by radio on the progress of their flight, exchanged information on the operation of the capsule's apparatus and systems, as well as taking note of data received from Earth. Along with this, they fulfilled various vestibular and physiological tests. Here is one of the entries confirming this:

"I work with the control panel all the time. It is not difficult to operate in any position."

From the further entries of V. Bykovskiy it is evident that the capsule responded easily to guidance, that it was obedient to the will

of the cosmonaut. Over the course of almost five whole days of flight the capsule's equipment operated without any failures. For this our scientists, designers, and workers who created the best cosmic "houses" for investigating the Universe, deserve the credit.

There is one curious entry on a page of the logbook. Bykovskiy later recalled it with a laugh during the meeting held at Moscow State University. By radio he had transmitted: "I had a bowel movement." But something happened to the last word, and Earth picked up the word "knock" [stuk] instead of "stool" [stul]. Questions immediately flew forth to him: "Where is the knock?" "What is the nature of the knock?" This was what Bykovskiy put down about it:

"Had a bowel movement (stool)." Then, this is set down in large letters: "And not a noise [stuk]. It was not difficult. It went off just as it had during my ground training, perhaps even better."

As you can see, the scientists and designers considered all details about the capsule, not just those affecting his working conditions, but also those affecting the well-being of the spacemen.

From the Logbook of V. Tereshkova

Two days had gone by since the "Vostok-5", guided by Lt. Col. V. Bykovskiy, had plunged off into the transcendental blue. Then, on 16 June, another capsule -- the "Vostok-6" -- was placed in orbit about the Earth. This time it was the world's first spacewoman, V. Tereshkova, bearing the tender name of "Chayka" [gull]. We saw her face on our TV screens, and were glad when she rewarded us with her wonderful smile. That meant that everything was going well and that our Valya was feeling fine. She mastered with exceptional speed a situation which was unusual for her and then, like her "heavenly brother", immediately got to work.

I am looking at her entries in the logbook. A precise, certain handwriting, differing little from that used in writing down abstracts in a college auditorium. The period and comma have been placed where they should be, and the sentences begin with a capital letter. In short, the entries follow all orthographic rules. Now, someone who was agitated, who was worried about the outcome of the flight could never write like that. Valya does not simply observe how the world opens up before her through the windows of the capsule. She gives her evaluation of what she sees:

"It feels as though the capsule went through everything well. There was a little excitement. Following disengagement of the last stage, the transition to weightlessness was very smooth; therefore, there were no sharp deflections or deviations. Perhaps this was because I was engaged in making my observations. With disengagement, dust particles emerged. As for vestibular analysis, no deviations from the normal were noted."

Later, an evaluation of the feeling of weightlessness. This is what Valya wrote down:

"In a condition of weightlessness: I feel light, have not lost my ability to perform my work functions, my mental attitude has always been cheerful, particularly after my talks with 'Yastreb'. All is well," she concludes, "when, far removed from everyone else, one can feel the shoulder of another."

Just below that there is a new entry which undoubtedly will be of interest to physiologists.

"Following the carrying out of vestibular tests, there were no unpleasant effects: neither dizziness nor uneasiness of stomach. I felt the same as if I were on Earth."

Valya is a noted sportswoman. Now in space could she get away from her favorite occupation.

"Doing the physical exercises," she writes, "always brings satisfaction. In addition to the prescribed set, I always add my own exercise movements."

Later, she returns to this topic more than once. From 0546 to 0600 hours on the 13th orbit she again did some physical exercises and set down this entry:

"Did the full set of prescribed exercises. Perspired quite a bit after doing them, but this evaporates rapidly with the air supply system such as it is. Did the physical exercises the first and second day, in keeping with the flight program.

"During some free time on the third day, I did more exercises, adding my exercises to the prescribed set, and got ready for the descent."

These entries more than demonstrate that systematic physical culture and sports and special training, including vestibular, helped Valya remain in the necessary good shape and to undergo the tremendous force of weight caused particularly in being hurled into orbit and during the descent.

Tereshkova was in flight for 71 hours and completed 48 orbits around the Earth, while covering a distance of about 2 million kilometers. An untrained organism simply could not have withstood such a load.

Valya proved herself to be a thoughtful researcher and a careful observer. Not a single small detail which was of interest to science escaped her eyes. For example, on one of the pages of the logbook, she drew a picture of the sun and the protuberances it was casting off into

space. If all of this could be set down in color, we would get a majestic picture. Unfortunately, she did not have such colors available aboard ship.

Valya, as did Bykovskiy and the other cosmonauts, saw the particles accompanying the capsule in flight. She wrote this down:

"Upon entry and during ascent, I observed a mass of small particles outside my right window. They were swimming rapidly past. A great number of tiny particles. I got the impression that I was going through a meteoric layer."

In a number of places, Valya gives a rather detailed, but not superficial, graphic and comparative description of the pictures opening up before her from her height in space.

"During the 6th orbit," she writes, "I observed a storm in the Indian Ocean. The sky lit up with bright flashes. At night the horizon is rather uniform, particularly before sunrise. Before sunset the spectacle is unique. The clouds over the oceans take on the form of a ridge or bank, like that of streets with small gaps in them. I never did succeed in taking pictures in the direction of that line of clouds. The luminous strip over the horizon (668 degrees) I could observe without the Moon, because there was none. This strip is grayish-milky white, with green haze shadings (I took pictures of it).

"I looked over the surface of the sea with the aid of a polaroid lens. The contrast is very greatly increased."

Valya was delighted over the way the instruments worked and did not fail either to note this in her logbook. For she, a woman, was the first of her sex to guide this remarkable spaceship.

"Under RO (orientation by hand -- the Editors), the capsule obediently turns in any given direction.

"...radio communications functioned well over the course of the three days."

"...the humidity control system functioned well during the course of the entire flight."

"...communications with the 'yastreb' were stable. The audibility was precise and good."

Summing up the results of her first day's flight, Valya entered this in her logbook:

"The flight is going normally. All of the capsule's systems are working well. A constant temperature is being maintained in the cabin of the capsule. The temperature is 30 degrees, but this decreased to 25 degrees by 1900 hours."

"The logbook and the maps are well situated. The switches are all nicely accessible. The illumination is well situated, and it is well that a turn-off switch was put in."

Such an evaluation of the spaceship's equipment does honor to our designers. They concerned themselves over making the cabin of the spaceship fully comfortable, in the full sense of the word, for the cosmonauts.

One of the entries was set down at 1634 hours.

"VSN-1 is asking 'Yastreb' what were the songs we were singing together. Why are you silent, Valerka?"

One gets the impression that this conversation is being held not out in the cold, far distances of space, but in a conversation held in a garden, when the heart is giving wing to song. This sounds spontaneous and without ceremony, this conversation.

Nor does Valya lose her sense of what is beautiful while she is out there in space. She is a great lover of music, and during her rest hours listens with pleasures to the melodies familiar to her. Noted in the logbook is this:

"I have had no delusions during the course of the entire flight, have never lost consciousness.

"The reproduction of music during my hours of rest or contemplation is very good. My ears pick up every chord, particularly during the broadcast of Chaykovskiy's piano concert."

Aboard the spaceship "Vostok-6," just like it was aboard the "Vostok-5", a measured rhythm of life's activity was established during the long flight: work, rest, sleep, plus eating at specified times. Of this Valya writes:

"My sleep is deep; not once did I waken from it. I woke up on the 13th orbit during the approach to Kamchatka. My appetite is good."

And, several pages later, this new entry:

"My condition following rest and sleep was always good. I do not begrudge the sleep, because in addition to the proper rest, I even managed to keep my grip on the pickup loops."

"My appetite was good. On the morning of the third day I ate some pastries with sprats and eggs, and drank cherry brandy and water."

True, she did not like the pastries. But the cherry brandy and water she drank with satisfaction.

One of the photographs reproduced today shows various geometric figures set down by Valentina Tereshkova during her flight. These are the so-called vestibular tests. The scientists, evidently, have already made their conclusions about these drawings. But one thing is clear: Valya never lost coordination of movement and the hand holding the pencil functioned truly.

...The years will pass. People will fly off to the Moon, to Mars, to Venus, and to the other planets in the solar system. But they will always recall the achievements of those who were the first to set down the cosmic path into the Universe. Or the laconic entries of our cosmonauts, or the pictures taken by them. These will go into the history of mankind as evidence of daring and of the courage of these Soviet people who did not lose presence of mind during these very first and most difficult flights into space.

- END -

Illustration on Page 3: "A page from the logbook of Lt. Col. V. Bykovskiy." The page is captioned: "Orbit. Time. V. Visibility of Rivers and Shores of Seas and Oceans." The handwriting is translated on Page 2 of the present text, beginning: "A new page, new observations:", to the bottom of Page 2.

Illustration on Page 4: "A page from the logbook of V. Tereshkova. Entries and Drawings made by V. Tereshkova in Space." The top entry in handwriting is translated on page 8: "I have had no delusions during the course of the entire flight, have never lost consciousness," and "The reproduction of music..., etc." The middle entry in handwriting is translated on page 7; omitted are the "During the 6th orbit, I observed a storm in the Indian Ocean. The sky lit up with bright flashes," and takes up with "At night the horizon, etc.," down to the line "I never did succeed in taking pictures in the direction of that line of clouds."

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